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ABSTRACT

The purpose of the study is to describe the status of literacy training programs in the military services during the summer of 1971 and develop suggestions for more effective training. A prologue provides information on the scope of the general literacy problem. Data were obtained through questionnaires, interviews, record search, and observations and formed the basis for a comparative description of the remedial reading programs of each of the services organized around the following major aspects of literacy training: (1) official and operational objectives, (2) entry level characteristics of trainees, (3) instructional subsystems, and (4) organization and evaluation of training. The report indicated wide diversity in teaching methods and in effectiveness of the various literacy programs. Suggested procedures for followup evaluation are included. (Author/MW)

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Report MR 74-6

MANPOWER DEVELOPMENT RESEARCH PROGRAM

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A Report On

Literacy Training Programs In The Armed Services

Manpower Development Division
Air Force Human Resources Laboratory

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The purpose of the study was to describe the status of literacy training programs in the military services during the summer of 1971 and to develop suggestions for more effective training. Data was obtained through questionnaires, interviews, record search, and observation. The report showed wide diversity in methods and effectiveness of the various programs. The inclusion of procedures for follow-up evaluation was suggested.

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SUMMARY

PROBLEM

Many young men entering military service possess poorer reading skills than are required for adequate performance in many military situations such as basic military training and technical schools. To them to adapt more successfully to military training and other requirements, each service has organized some form of literacy training program to raise reading skills to a predetermined level. The scope of these programs is indicated by the fact that during the preceding year over six thousand men received literacy training at the nine locations visited during the course of the study.

Related to this problem is the significant spread between the average reading ability of incumbents in some military specialties and the higher reading level required to understand the manuals, technical orders and other job related materials as shown by earlier research supported by OASD (M&RA). However, the issue of job related literary requirements is very complex and is beyond the scope of this paper. (See Prologue)

APPROACH

The purpose of this study was to describe literacy training programs in the military services during the summer of 1971 and to develop suggestions for more effective training. The information presented was collected during visits to nine military installations and reflects conditions that existed in the summer of 1971. These visits encompassed all the literacy training programs in the Air Force and Navy and five of the

Army's programs. The Army basic training centers were chosen to assure representativeness of programs and recruits while remaining within funds available for the project. The data were obtained through questionnaires and interviews, examination of educational records and instructional materials, and observation of the instructional process.

RESULTS

Based upon the data collected during the visits a comparative description of the remedial reading programs of each of the services was developed. The description was organized around the following major aspects of literacy training: official and operational objectives; entry level characteristics of trainees; instructional sub-systems; organization and evaluation of training.

1. The overall objective of the literacy training programs in the military services is to assist recruits to meet the reading level standards of the different services. The Air Force aims at a sixth grade reading level while the Army and Navy seek to raise their recruits to the fifth grade reading level.

2. The Air Force and the Army routinely gave a reading achievement test to each recruit scoring below a certain point on the AFQT. Two of the Navy installations waited for evidence of lack of progress in boot camp before initiating testing for reading deficiencies.

3. While three-fourths of the trainees in the literacy training program had AFQT scores below 20, 43 percent had graduated from high school.

4. Instructional methods and techniques are quite varied among the

service literacy programs depending upon the trainee's needs and instructor's preferences. Relatively little use is made of audio-visual materials, and, very little use is made of programmed instruction materials except for the literacy programs in the Air Force and at the Orlando Naval Training Center.

5. In each of the services' training programs, students progress at varying rates with approximately two-thirds achieving the desired reading levels. On the average, the Air Force students who are required to reach a higher reading level spend twice as much time in remedial reading training as do their counterparts in the Army and the Navy.

CONCLUSIONS

The literacy training programs operated by the military services to assist basic trainees with poor reading skills to adapt more readily to military training, are of recent origin. The literacy training programs developed by each service have somewhat different goals. The training materials and methods, the techniques for identifying those trainees lacking functional literacy skills and the criteria for reentering them into the basic training cycle differ from service to service. The problems of defining adequate literacy skills, which are often related to job requirements or personal needs were resolved primarily through use of standard tests or observed performance in basic military training. A number of such tests were used to measure progress in class and to determine when reading skills reached the criterion level. The day-to-day operation of the literacy training programs was often based on the eclectic use of materials and methods to meet the needs of the moment. Methodologically,

there was a lack of suitable material and proven techniques specifically designed for teaching reading skills to young adults. The different approaches to training, however, appeared to achieve the stated objectives of the literacy training programs. Many young men with inadequate reading skills were raised to a functional literacy level.

PROLOGUE

The principal objective of this study is to describe the literacy training programs operated by the military services during 1971 to assist new accessions to adapt to basic training. However, the study calls attention to, but does not address, a number of issues related to the general literacy problem. The need for a given level of reading skill in order to understand manuals, technical orders (T.O's) and other sources of job information was established in earlier research supported by OASD (M&RA) Directorate of Manpower Research. These data indicate a considerable discrepancy between the reading comprehension level* of a sample of job incumbents in some densely populated occupational specialties** and the level at which the job data was written***. Depending upon the specialty the estimated spread between reading skill and the reading material was as much as four to six grade levels for non-Category IV personnel and six to eight grade levels for lower Category IV personnel. This obvious gap between the available skill and the apparently required skill has implications for supervisory behaviors, training needs, job knowledge, job proficiency achievement, and perhaps the development

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* The average reading level for this sample was eighth grade; when aptitude was taken into account non-Category IV personnel average slightly more than the tenth grade level.

** The occupations were organizational supply specialists, armor crewmen, and vehicle repairmen.

*** The reading difficulty of the manuals, technical orders and other materials range from the tenth grade level to the 16th grade level with much of the material at the 12th grade or above.

of job data. The observed difference between literacy skill and need, can cause significant delays in developing journeymen job proficiency and create problems in obtaining effective manpower utilization. This condition appears to exist as well in the more technical occupations and, in fact, has been demonstrated to some extent. However, it has been very difficult to objectively demonstrate a direct effect of poor reading skills upon job performance, despite the availability of considerable data indicating a number of indirect or contributary relationships.

Functional illiteracy, which the services' literacy training programs are primarily designed to treat, may influence not only trainability and proficiency, but may affect the individual's ability to cope in an administratively complex organization. Functional illiteracy, apparently, is one of the factors which predisposes an individual to failure in the military service, as a majority of those unable to complete full tours are among the low aptitude, less well educated accessions.

The seriousness of this problem has been recognized during the past few years with the military departments having instituted corrective programs with stated goals to increase literacy skills to the fifth and sixth grades. These goals, based in part upon test results and observation of literacy needs, described that level deemed necessary to succesfully complete basic military training.

Despite the formal recognition of the need for literacy skills training, there is a basic concern among managers and instructors as to:

1. The degree to which literacy level is related to performance in basic military training, and, more substantively, to later successful training and performance in an assigned specialty;

2. Whether the skill increase obtained during literacy training was retained over time and useful to the trainee;

3. The adequacy of a fifth or sixth grade reading skill to influence later job performance or to enhance personal satisfaction;

4. The literacy level(s) required for reaching journeymen skill levels in different occupational specialties in a reasonable period of time;

5. The trainability of young adults in the lower aptitude categories to achieve significantly more effective literacy levels;

6. The effect of low reading skills on working relations with supervisors and peers when written directions must be followed.

It is becoming apparent that the impact of literacy upon personal or job behaviors, though real, is a multi-faceted process and that determining the utility and feasibility of literacy training for the disadvantaged reader is a complex problem. This problem has not been subjected to extensive research, thus the evidence available is sufficient to reach only the most general conclusions about the scope and seriousness of the problem. Currently, much more data and analysis is needed in this area. It is known, for example, that reading skill is related to performance on specially constructed job knowledge tests and job sample (performance) tests. However, AFQT scores are also related to these tests as well as to reading ability.

Another finding is that a much larger percentage of those with poor

reading skills prefer to obtain job information by asking others in contrast to those with adequate reading skills. The effect of such dependency upon supervisors' attitudes toward the incumbent and upon acceptance by peers has not been explored. This finding probably accounts for the fact that most of those with low reading skills are able to complete a full military tour.

It is reasonable to assume that with the current complexity and the probable increases in technology that future successful performance in the service will require reasonably high levels of literacy. This will continue to be true even if job data is reduced in complexity and reading comprehension level.

The literacy problem is also widespread in the civilian community. Current Office of Education estimates indicate that more than twenty million adults are functional illiterates and that seven million of forty five million children now in public school will leave with inadequate reading skills. Thus, even optimistic projections of manpower flow into the military service from the civilian community must include many with literacy problems. Currently DoD accessions are entering remedial training programs at a rate of some 14,000 per year with the Army accounting for approximately half of this number. Thus functional illiteracy remains a management problem that will require more positive, systematic effort than has been directed to it heretofore.

There is evidence that inadequate reading skills may be remedied through specific job related training since they are frequently related to a personal lack of appropriate experience or specific training rather

than being solely attributable to lack of education or to aptitude level. There are preliminary, positive results from Air Force remedial programs conducted to raise the reading skills of apprentice and journeyman airmen to the level required to pass on-the-job training requirements. An experimental remedial reading program conducted by the Human Resources Research Organization also indicated that such an approach to the remedial reading problem is feasible.

It appears highly probable that the estimates of a continued flow of accessions with reading problems into the Armed Forces are essentially correct. If so, it may prove cost-effective to concentrate substantial research and development resources on an examination of a low literacy skill cohort on a longitudinal tracking basis in order to develop a better theoretical basis and to derive empirical training methods and management concepts to deal with this problem.

The need for a more comprehensive effort on this problem is evident in the unanimous recommendation of the Working Group on Listening and Reading in the Armed Services made in November 1970. This recommendation was that "literacy training be designed following a system approach, which would include the thorough assessment of literacy requirements of the various military occupations, the orderly structuring of training programs geared to satisfying the occupational requirements, and, most importantly, well designed evaluative procedures to provide feedback for program improvement."

During the period since these recommendations were advanced, progress has been made in defining more realistic literacy training goals in improving remedial literacy training methods, and in developing a broader

appreciation of the functional literacy problem.

The Army is initiating a remedial training concept to raise the trainees reading comprehension level to that required to function in an occupational area through extensive use of job related material. The Navy has conducted an extensive study to describe accessions' reading skills. Additionally, the reading level of job data for a number of occupations was determined. Recommendations for programs to reduce the gap between available reading skills and job required comprehension level are being formulated.

These are positive steps, and it is hoped there will be sufficient follow-up and evaluation of these programs to insure progress on this problem.

Progress in dealing with the literacy problem is essential if the productive potential and more effective utilization of a portion of our manpower resources are to be achieved.

M. R. Rose

M. Richard Rose
Deputy Assistant Secretary
(Education)

PREFACE

The purpose of this study was to describe the current status of literacy training programs in the military services and to develop suggestions for an improved training model. During visits to nine military installations, data were obtained through questionnaires and interviews, examination of educational records and instructional materials, and observation of the instructional process. A report was organized around the major parts of the literacy training programs and suggestions for improvement were presented.

The study was conducted under contract number F 41609-71-C-0031 by International Training Consultants, Inc., for the Air Force Human Resources Laboratory. The Air Force contract monitor was Dr. Francis D. Harding. Support for the project was obtained from the Office of Assistant Secretary of Defense for Manpower and Reserve Affairs, Education.

The Principal Investigator was R. Mark McGoff. The report was revised and edited by Francis D. Harding of the Air Force Human Resources Laboratory (MDA).

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SECTION I

LITERACY TRAINING OBJECTIVES

The overall objective of the military training programs is to assist entering recruits who do not meet the reading level standards of the different military services. When establishing the programs each service promulgated formal objectives which defined the purposes and goals of the programs. These formal objectives are as follows:

Air Force: In School Regulation 23-1, dated 15 April 1971, the objective of the Reading Proficiency Unit is stated: "The desired academic goal is for trainees to attain a reading ability through the sixth grade level, as determined by their demonstrated ability in class and by the results of the USAFI Achievement Test II Reading Comprehension Test, UAT II."

Army: The objective of the Army Preparatory Training (APT) program is stated in USCONARC Regulation 350-1, dated 9 September 1970: "This program, consisting of basic education in reading, arithmetic, and social studies, supplemented with introductory military training, is given to upgrade the reading capabilities of trainees to a fifth grade level or to the extent practicable within a time frame of not to exceed 6 weeks."

Navy: The objective of the Navy literacy programs is stated in a memorandum of the Bureau of Naval Personnel, dated 13 September 1967. Pers-C21la-dor, Ser: C21/209 states: "The objective of the remedial literacy training program is to raise the reading level of all enrollees

to grade equivalent score of approximately 5.0 as quickly as possible."

In addition to the established objectives, interpretations at the operational level have modified the stated objectives in some instances. In the Air Force the formal objective is fully accepted. There is no instruction in academic areas other than reading, and reading proficiency is measured by the USAFI Achievement Test II.

All the Army posts visited conducted instruction in the three areas of reading, arithmetic, and social studies. In addition to basic skills, Fort Dix provides instruction in such areas as the handling of bank accounts, budgeting, writing of letters, the writing of poetry, and the interpretation of topographical maps. At Fort Jackson, because of the large number of Spanish-speaking recruits, a major concern of the literacy program is instruction in English as a second language.

Of the Navy programs, the personnel at Orlando Naval Training Center state their program objective in terms of a reading level only. There is no instruction in areas other than reading. This program has not fully accepted a fifth grade reading level as its objective, however. The grade level objective was changed to grade 4.5 when it was determined that recruits with a 4.5 reading level were as successful in boot camp as were recruits with a fifth grade level.

The reading level objective of the program at San Diego NTC is fifth grade. However, it can be inferred from the content of the program that a major objective of the program is that recruits will demonstrate

a knowledge of military information sufficient to insure success in boot camp. Reading skills are learned in a military context, and there is much emphasis upon military instruction. The program instructors state the program objective is that eighty percent of recruits who complete Academic Remedial Training will be successful in boot camp.

The personnel of the Recruit Remedial Literacy Training Unit (RRLTU) at Great Lakes state two objectives of their program:

1. That recruits will read at the fifth grade level.

2. That recruits who complete the RRLTU program will pass the Boot Camp Final Achievement Test.

The first objective is considered to be of little importance by the personnel of RRLTU. Many recruits enter the program with a reading level above the fifth grade and other recruits who are considered successful in the program leave the program reading below a fifth grade level. No summary statistics are maintained by program personnel concerning this objective.

This second objective is considered to be very important and the entire RRLTU program is structured for its accomplishment. There is much emphasis upon military instruction which will prepare recruits for the Boot Camp Final Achievement Test. The program instructors receive feedback concerning recruit success on the test and maintain detailed summary statistics concerning this criterion measure.

SUMMARY AND RECOMMENDATIONS FOR SECTION I

The overall objective of literacy training programs in the military

is to assist recruits to meet the reading level standards of the different services. The Air Force aims at a sixth grade reading level, while the Army and Navy seek to raise their recruits to the fifth grade reading level. In practice, besides reading skill development some Navy programs also emphasize skills required in boot camp. Since at present such additional objectives are not officially endorsed, it is suggested that literacy training should officially include job related skills in addition to reading levels as part of their objectives. These objectives could be stated in terms of the literacy and communication skills needed to succeed in basic training. An additional benefit which should accrue from this change would be increased student motivation resulting from relating skills learned in literacy training to the proximate military career goal, graduation from basic training.

SECTION II

ENTRY LEVEL CHARACTERISTICS

IDENTIFICATION OF PERSONNEL NEEDING REMEDIAL TRAINING

An important feature of the remedial training is the identification of personnel who would benefit from participation in the program. Each service employs somewhat different procedures to screen incoming personnel for reading deficiencies and assignment to the reading improvement program. In the Air Force all men scoring below 21 on the Armed Forces Qualification Test (AFQT) are administered a reading achievement test during their processing into the military. Those men who achieve below the sixth grade reading level on the achievement test are placed in the Reading Proficiency Unit.

In the Army all low scorers on the AFQT are administered an achievement test of reading, arithmetic, and social studies during their processing into the military. Those men who demonstrate less than a fifth grade proficiency on the reading section of the achievement test are placed into the Army Preparatory Training (APT) program.

Each of the three Navy installations differs in its determination of recruits to be tested and placed into literacy training. At Orlando, the low scorers on the AFQT are administered a reading achievement test. Those recruits who score below grade level 4.5 in reading are placed into Academic Remedial Training. At San Diego NTC, low scorers on the AFQT are not automatically scheduled to take an achievement test of reading. All recruits, regardless of previous test scores, are placed

into a boot camp training company immediately following their processing into the military. If a recruit fails the achievement test at the end of the third week of boot camp he will be administered an achievement test of reading. If he scores below a fifth grade level on the reading test, he will be placed into the Academic Remedial Training Program.

The placement testing at Great Lakes NTC is also involved with the regular boot camp testing program. As is the case at San Diego, all recruits, regardless of previous test scores, are placed into a boot camp training company immediately following their processing into the military. If a recruit fails an achievement test given at the end of each week of boot camp, he will be given an informal, oral reading test by one of the instructors from the RRLTU. If, in the judgment of the testing instructor, the recruit has a reading problem, he will be placed into the RRLTU program. After the recruit has been placed into the literacy training program, he will be administered a reading achievement test to determine his reading level.

Each service administers different reading placement tests to determine the reading levels of prospective trainees. The placement test utilized by the Air Force is the USAFI Achievement Test published by the California Test Bureau, Level II, 1950 edition, 1967 printing, Form AA. This timed test of reading achievement consists of two sections: reading vocabulary and reading comprehension. The reading vocabulary section of the test consists of four sections: word form, word recognition, meaning of opposites and picture association. The reading comprehension section

of the test covers two areas: following directions and interpretation of material. The test is designed to measure reading levels between grade levels 3.5 and 4.9. (Although the test is designed to measure primarily reading levels between 3.5 and 4.9, it does give a range of reading scores from first grade to eighth grade.) The norms for the test have been established among a cross-section of elementary school students. This test is generally accepted by educators as an accurate measure of reading ability.

All Army installations administer the USAFI Intermediate Achievement Test as a placement instrument. The USAFI Intermediate Achievement Test is the Metropolitan Elementary Reading Test published by Harcourt, Brace, and Jovanovich. The test is designed to measure reading levels between grade four and grade six and yields three scores: vocabulary, comprehension, and total score, or reading grade level. The norms for the test have also been established among a cross-section of elementary school students. This achievement test of reading is frequently used in public schools and is generally well accepted by educators as a valid measure of achievement.

The USAFI Intermediate Achievement Test (Metropolitan Reading Test) and the USAFI Achievement Test II (California Reading Test) are similar measures of reading achievement. They have similar sub-tests and yield total scores. Normative values for the tests are based on elementary school students performance and are extensively used in public schools.

The reading placement test used in the Navy programs is the Gates-MacGinitie Reading Test, published by Teachers College Press, 1965

Survey D, Forms 1, 2, and 3. The test is designed to measure reading proficiency in grade levels four through six, and consists of three parts: speed and accuracy, vocabulary, and comprehension. An entry reading grade level is determined for recruits on the basis of the vocabulary and comprehension sections of the test. The speed and accuracy section is not considered in establishing an entry reading level, although this section provides the instructors with additional information concerning the reading proficiency of the recruits.

TRAINEE CHARACTERISTICS

At each installation, the study team sampled the recruit records to obtain information about the literacy program. The size of the sample was determined according to the number of program participants during the first year and the availability of appropriate data. In a large program of more than a thousand participants, the sample consisted of a minimum of ten percent of the recruit records; in a program of 500 to a thousand participants, the sample consisted of a minimum of fifteen percent of the recruit records. The samples revealed the following information concerning the characteristics of recruits taking part in the literacy programs.

Entry Reading Level - Table 1 presents a distribution of the reading levels possessed by literacy program trainees whose records were reviewed during the visits.

Table 1

Distribution of Entry Reading Grade Levels

	Entry Reading Grade Level						
	1	2	3	4	5-6	N	Mean
Air Force	1(0)	9(3%)	30(11%)	115(43%)	115(43%)	270	4.2
Army	25(5%)	38(7%)	190(36%)	276(52%)	0(0%)	530	3.4
Navy	0(0%)	22(11%)	51(27%)	106(56%)	9(5%)	190	4.0
Total	26(3%)	69(7%)	271(27%)	497(50%)	124(12%)	990	3.7

Over three-fifths of the trainees entered the programs reading at or above fourth grade level as measured by the placement tests. Ninety percent were at the third grade level or higher. The overall mean grade level for services was 3.7.

AFQT Scores - Another characteristic of trainees that is relevant to remedial reading programs is their aptitude level as measured by the Armed Forces Qualification Test which tests verbal, numerical, spatial and mechanical learning abilities. Table 2 shows a distribution of AFQT scores for each of the services. The data presented is based upon information that was available at the time of the visits. Three-quarters of the literacy program trainees had AFQT scores below 20 with the Air Force and Navy tending to have more trainees with higher aptitude scores than did the Army.

Table 2

Distribution of AFQT Scores

	N	AFQT 10-14	15-19	20-24	25-29	30 & over
Air Force	270	99(37%)	97(36%)	43(16%)	31(12%)	0(0%)
Army	179	65(36%)	73(41%)	30(17%)	8(4%)	0(0%)
Navy	147	44(30%)	61(42%)	19(13%)	9(6%)	14(9%)
Total	596	208(35%)	231(39%)	92(15%)	48(8%)	14(2%)

Years of Education - Forty-three percent of the literacy program trainees had graduated from high school with two percent claiming more than 12 years of education. The average number of years of education was 11.0, 10.3 and 10.8 for the Air Force, Army, and Navy respectively.

English as a Second Language - While at most installations visited no records were kept as to the number of trainees who did not speak English as a first language, it became apparent that this was an important factor affecting a sizeable number of trainees. At Fort Dix, 14 of 121 recruits, and at San Diego, 9 of 46 recruits in the sample did not have English as their first language. At Fort Jackson where a large percentage of the trainees were Spanish speaking Puerto Ricans, 81 of 122 (66.4%) did not have English as their first language. According to the program staff, the entry reading level of such trainees was quite low and their lack of fluency in English made it difficult for them to benefit from the regular literacy training.

SUMMARY AND RECOMMENDATIONS FOR SECTION II

It was found that each service used somewhat different procedures to screen incoming recruits for reading deficiencies. The Air Force and

Army routinely gave a reading achievement test to each recruit who scored low on the AFQT. While a similar procedure was followed at Orlando NTC, both the Great Lakes and San Diego installations waited for evidence of lack of progress in boot camp training before initiating testing for reading deficiencies. The placement test used by the Air Force is the USAFI Achievement Test while the Army uses the USAFI Intermediate Achievement Test. The placement test used by the Navy is the Gates-MacGinitie Reading Test.

As a corollary of the preceding suggestion about making literacy training more relevant, the identification of individuals needing literacy training should be based more upon difficulties encountered during military training than on performance on reading achievement tests given upon entry into service. A practice similar to the Navy's should be established so that recruits who experience academic difficulty during their initial training are given reading and communication skills placement tests to determine if such deficiencies are responsible for their failures. Military instructors and staff who come in contact with recruits during their early days in the service should be trained to identify individuals with reading problems. In addition, there should be uniformity among the tests used to identify and diagnose reading deficiencies. Also, such tests should be suitable for the adult population represented by recruits entering military service.

An analysis of the characteristics of the trainees in the literacy program indicated that while three-fourths of them had AFQT scores below

20, forty-three percent had graduated from high school. It was also disclosed that another factor contributing to the reading deficiencies of some of the recruits was the fact that English was not their primary language. This was especially true at those reception centers which drew their trainees from areas with large Spanish speaking minorities. For these trainees, the literacy programs became one of teaching English as a second language, a process which was different from teaching reading skills and functional illiterates. The effectiveness of the effort would be improved if provisions were made to meet the needs of these trainees.

SECTION III

INSTRUCTIONAL SUBSYSTEMS

INSTRUCTIONAL MATERIALS AND EQUIPMENT

At each installation instructors were asked to indicate on a questionnaire the instructional materials and equipment which they utilized regularly in the literacy training program and the extent of that use. It was not possible to verify the extent of utilization or to determine that each listing of materials and equipment was exhaustive. All the materials and equipment listed by the instructors are included in the following tables. Materials which are distributed by USAFI, but are also available through commercial sources, are listed as commercial materials.

In Table 3 the instructional or grade level difficulty is indicated for each of the materials. Each of the materials are classified as to the type or kind of material. These classifications are:

A. Narrative With Prepared Test of Comprehension. This type of material can be fiction or non-fiction narrative, self-contained or within a workbook, and usually consists of fewer than a thousand words. The test of comprehension has been prepared by the publisher and usually consists of ten to twenty-five questions.

B. Narrative Without Prepared Test of Comprehension. Included in this type of material are story books, novels, and reference books.

C. Military Instruction. Classification of this type of material refers more to content than to format of the material. If the purpose

is to teach military content rather than reading skills, per se, it has been placed into this classification.

D. Drill Materials. Included in this classification are flash cards, worksheets, and materials designed for the practice of reading skills in isolation.

E. Programmed Instruction. These materials allowed a student to work independently, at his own constructed responses. They are in workbook format.

The installation where the materials are used is indicated by assigning the following numbers to the installations: (1) Lackland Air Force Base, (2) Fort Lewis, (3) Fort Leonard Wood, (4) Fort Dix, (5) Fort Campbell, (6) Fort Jackson, (7) San Diego, (8) Orlando, and (9) Great Lakes.

The Instructional Materials Table indicates that, except for the Naval Training Centers, the most frequently used materials for instruction are the Reader's Digest. Five of the installations utilize the Science Research Associates Reading Laboratory. All of the Army posts utilize USAFI materials. The most frequently used books are Men in the Armed Forces and Stories for Today.

Table 4 contains a listing of the audio visual equipment utilized in the literacy programs, and an indication of the installations which utilize each kind of equipment. Of the nine installations, seven employ tape recorders for instruction. In four programs, there is extensive use of materials and equipment from Educational Development Laboratories (EDL). Four installations also

indicate that they use a film projector for instruction. In five programs, there is some use of reading pacers designed to improve the reading speed of the students.

Table 3

INSTRUCTIONAL MATERIALS

Commercial Materials	Instructional Level	Type	Where Used								
			1	2	3	4	5	6	7	8	9
Checkered Flag Series	4-5	B				4			7		9
Dolch Basic Sight Word List	1-3	D				4					
Dr. Spello	1-5	D						6			
EDL 100 Audit Literacy Program	1-5	A,D								8	
EDL Study Skills Library	4-9	A	1			4			7		9
How and Why Wonder Books	4-5	B							7		
In Orbit	4-5	B							7		
McCall-Crabbs Standard Test Lessons in Reading	2-12	A			3						
Merrill Linguistic Reader	2-4	A,D			3						
Milton Bradley Reading Aids	3	D			3	4					
Modern Reading Skills	4-6	A	1								
Mott Basic Language Skills Program	1-5	D				4					
Mott Comprehension Series	1-5	A							7		
Mystery Series	4-5	B							7		
On Target	4-5	B							7		
Pacemaker Classics	4-5	B							7		

Table 3, Instructional Materials (Contd)

Commercial Materials	Instructional Level	Type	Where Used								
			1	2	3	4	5	6	7	8	9
Programmed Reading (Globe)	5-6	E							7		
Programmed Reading (Sullivan)	1-3	E	1								
Reader's Digest Skill Builders	2-8	A	1	2	3	4	5	6			9
Reading Attainment System	1-5	A							7	8	
Reading Motivated Series	6-9	B							7		
SRA Better Reading Books	5-10	A	1		3						
SRA Reading for Understanding Laboratory	3-12	A,D		2							
SRA Reading Laboratory	4-6	A	1		3	4			7		9
SRA Pilot Laboratory	3-6	A	1								
Springboards Reading Laboratory	1-6	A							7		
Top Flight	4-5	B							7		
Military Materials											
On Your Mark	1-3	D				4	5				
Get Set	3-5	A				4	5				
Go	6+	A				4	5				
Men in the Armed Forces	4-6	A		2	3	4	5	6			
My Country	4-6	A				4					
New Flights in Reading	4-6	A			3	4	5				

Table 3, Military Materials (Contd)

Military Materials	Instructional Level	Type	Where Used 1	2	3	4	5	6	7	8	9
Servicemen Learn to Read	3-5	A,D		2		4	5				
Stories for Today	3-5	B		2	3	4	5	6			
Stories Worth Knowing	3-5	B				4					
Basic Military Requirements	6+	B,C									9
Blue Jacket's Manual	6+	B,C							7		9
Recruit Training Command Study Guide	6+	B,C									9

TABLE 4

AUDIO-VISUAL EQUIPMENT

Equipment and Description	Where Used								
	1	2	3	4	5	6	7	8	9
Bell and Howell Language Master. Printed card with magnetic tape is inserted into special tape recorder, allowing student to hear and see simultaneously. Used for phonics and work discrimination drills at lower elementary level.	1								
Craig Reader. Reading accelerator which uses slide units rather than film.					5				
EDL Aud-X. Prepared sound and screen unit designed for use with workbooks.				4				8	
EDL Controlled Reader. Reading accelerator which utilizes filmstrips.	1			4			7	8	
EDL Tach-X. Tachistoscope designed to develop visual discrimination and memory. Images can be projected on a screen for as long as 1 1/2 seconds or as briefly as 1/100 of a second.				4				8	
PDL Perceptoscope. Projector which serves as accelerator, projector, tachistoscope, or timer and utilizes prepared films.	1								
Overhead Projector. Device which projects prepared material onto large screen for group instruction.				4			7		9
Record Player.		2							
16mm Film Projector.					5	6	7		9
SRA Reading Accelerator. Pacer designed for use with any printed material.							7		
Slide Projector. Utilizes silent to sound filmstrips.		2							
Tape Recorder.	1	2		4		6	7	8	9

The information contained in Table 5 below was compiled from questionnaires completed by instructors, from interviews of instructors and trainees, and from classroom observation,

As Table 5 indicates, the most frequently used type of material is narrative with a prepared test of comprehension. This type of material is an integral part of the instruction at five of the nine installations and is used often at the other four installations.

The least utilized types of materials are programmed instruction and narrative without a prepared test of comprehension. There is also very little use of audio-visual equipment at most of the installations, although there is equipment available to each of the programs. In only two of the programs is the use of audio-visual equipment an integral part of the instructional program.

At five of the installations, there is frequent use of military materials. In two of the Navy programs, the focus of instruction is military and the use of military materials is an integral part of the programs.

Table 5

Relative Frequency of Use of Materials and Equipment

Type of Material	1	2	3	4	5	6	7	8	9
Narrative With Prepared Test of Comprehension	E	E	O	O	O	O	E	E	E
Narrative Without Prepared Test of Comprehension	I	O	O	O	I	I	O	I	I
Military Instruction	I	I	O	O	O	I	E	I	E
Drill Materials	I	O	O	O	O	O	O	E	E
Programmed Instruction	E	I	I	I	I	I	I	E	I
Audio-Visual Equipment	I	I	I	E	I	I	O	E	I

I=Used Infrequently or Not at All; O=Used Often, But Not Everyday;
E=Used Everyday as Integral Part of Instructional Program

INSTRUCTIONAL METHODS

The history of literacy training is replete with various theories and methods used to help the student to identify and recognize the printed symbol. These theories and methods are often given the generic labels of synthetic, analytic, or analytic-synthetic methods and may be described as follows:

Synthetic Theory and Methods. The Synthetic Theory is that letters, sounds, and syllables must be combined to form words, and that words must be combined to form sentences. The methods used in conjunction with this theory begin with work elements, with letters (Alphabet Method), with sounds (Phonic Method), or with syllables (Syllable Method).

Analytic Theory and Methods. The Analytic Theory of literacy training is that the beginning point is the word, phrase, or sentence and that these larger units are then broken down into their basic elements. Methods which begin with words are the whole-word approach and the decoding of the written symbol. Methods which begin with phrases and sentences (or longer narratives) emphasize that meaning comes only through the grasping of the language structures exemplified in a sentence, i.e., key words, context, word and sentence order. The theory emphasizes the importance of comprehending the total meaning of the printed material and is less concerned with mastery of the reading elements. This theory allows the reader to "miss" a few words as long as he understands the material.

Analytic-Synthetic or Synthetic-Analytic Theories and Methods. These theories and methods exemplify a more eclectic approach to

literacy training. The Analytic-Synthetic Method begins with the total word, sentence or narrative and then more or less simultaneously breaks it down into its elements for meaning. The Synthetic-Analytic Method begins with the elements and then combines these to form meaningful words, sentences, or narratives.

There are two parts to the Air Force literacy program at Lackland AFB. Programmed reading is designed to present instruction in phonics and other elements to those airmen who read below a third grade level. This part of the program is synthetic in theory and method. Small bits of information are presented to the learner so that he learns phonics, then words, then sentences, then longer narratives. The second part of the program is graded reading, which presents reading instruction from the fourth to sixth grade levels. In this part of the program the bulk of instruction consists of students reading narratives and taking prepared tests of comprehension of the narratives. This method is analytic in that the student is presented with the whole (the narrative) and is asked to reduce the narrative to its essential meaning (correct responses to the comprehension test.) The emphasis is upon meaning and the student is not expected to be able to read each narrative without error.

In the Army literacy program, both the Analytic-Synthetic and Synthetic-Analytic methods are used. The eclectic approach results from the fact that the instructors in these programs determine the content and method of instruction. At many of the posts, the method of instruction varies from one classroom to the next.

In the Navy, the theory and method of instruction at Orlando NTC is in large part synthetic. The use of EDL instruction devices and programmed instruction presents students with information in hierarchical order and with increasing difficulty. At Great Lakes NTC and San Diego NTC, the first week of instruction in phonetics is based in the synthetic theory and method of instruction. Throughout the remainder of the instruction at these two bases, there is more emphasis upon the analytic approach in deriving meaning from longer narratives, as measured by tests of comprehension.

In addition to the above theories of literacy training, there are two other theories involved in the literacy programs which should be mentioned. The first is the Whole-Man Theory. At Fort Dix, this theory receives some emphasis. In addition to literacy training, there is additional instruction in areas such as the handling of bank accounts, budgeting, writing letters, the writing of poetry, and the reading of maps. The theory espoused by several of the instructors was that any instruction is appropriate if it assists the recruit during his military service. This second theory, the Military Man Theory, is fully accepted at Great Lakes NTC and San Diego NTC. The content of the instructional material is largely military and there is great emphasis upon preparing recruits for success in boot camp.

SUMMARY AND RECOMMENDATIONS FOR SECTION III

A review of the several programs showed a utilization of a wide range of instructional materials and methods among which the Reader's Digest Skill Builders and Science Research Associates' Reading Laboratory materials were the most frequently used. These are both narrative

materials with tests of comprehension prepared by the publisher. Relatively little use is made of audio visual materials in the program. However, to the extent that they are used, tape recorders were the most popular followed by the Educational Development Laboratories' reading development materials. Except for the Air Force and Orlando Naval Training Center, very little use is made of programmed instruction materials. Generally, it would seem worthwhile to determine which materials are the most effective and to incorporate these into all programs. While instructor creativity should be encouraged, it shouldn't be allowed to perpetuate the use of ineffective techniques.

In regard to instructional methods, the programs are quite varied depending upon the trainees' needs and the instructor's preferences. The Air Force uses programmed instructional materials for those reading below the third grade level with graded reading material for the other trainees. The students progress at their individual rates with milestone tests given to measure progress and training tailored to individualized needs. The Army programs are quite eclectic in approach while the Navy utilizes a combination of the synthetic and analytical approaches of instruction.

SECTION IV

ORGANIZATION AND EVALUATION OF REMEDIAL READING TRAINING

ORGANIZATION AND TRAINING

The standard course of the Air Force Reading Proficiency Unit is thirteen weeks, sixty-five training days, 260 hours. The students are always divided into two groups, each of which receives four hours of instruction per day. The students are placed into classes according to their levels of achievement in the following way: Basic Class-Grade Level Three and Below: Intermediate Class - Grade Levels Four and Five; Advanced Class - Grade Level Six and Above.

Although students are placed into classes according to their levels of achievement, they do not receive group instruction. Through the use of programmed instructional materials and a systems approach to reading the trainees receive individual instruction and make progress at their individual rates. The approach is that the instructor will introduce a short unit of work to a student, the student will work independently on the work unit and complete and correct a unit test. The student will confer with the instructor concerning the results of the unit test, and will then be introduced to the next unit of work.

Each student, as he progresses through the program, will also take tests at defined milestone points. The milestone tests are power tests and are untimed. The tests are corrected by the instructor, and if a student demonstrates mastery of the level, he will be advanced to

the next level of difficulty. If a student fails a milestone test, he will be provided remedial instruction and will take an alternate form of the milestone test after completing the additional instruction.

The program criterion test (USAFI Achievement Test) will be administered to each student after he has successfully completed the milestone test corresponding to the sixth grade level. If he demonstrates a sixth grade reading level on the criterion test, he will leave the literacy program and will join a basic training company. All students are administered the criterion test after they have spent the maximum sixty-five days in the program.

Although the system of individualized instruction and milestone testing allows the students to complete the program at any time, a student will usually not be administered the criterion test until he has spent at least one week in the program. The stated maximum days of instruction are sixty-five, although a few recruits received instruction for sixty-six days.

The Army Preparatory Training (APT) program is six weeks or 180 instructional hours in duration. The recruits are scheduled for six hours of instruction each day, and each class period is fifty minutes. In addition to reading instruction, the CONARC guidelines require that recruits receive one hour of instruction in arithmetic and one hour of instruction in social studies each day.

The average class size of the Army programs is ten to twelve students. Students are not grouped according to ability or achievement. In each of the Army programs, the teachers are assigned to a classroom

and are given much freedom in determining the instructional content and techniques to be employed in the classroom. Nearly all of the instructors employ teacher-directed instruction as the principal method of teaching.

At each of the Army installations, it was stated that tutorial assistance is made available to the students on an as-needed basis. Only one program (Fort Dix), however, had a defined tutorial program and had assigned an instructor full-time to provide tutorial assistance. Any student with special learning problems or language problems will receive intensive tutoring away from his regular classroom.

There are no defined milestones within the programs. Some teacher-constructed tests and workbook tests are used as measures of progress within the programs. The criterion test used in the programs is the USAFI Intermediate Achievement Test (UIAT). The test is administered to all recruits at the end of their third and sixth week of the program. (A recruit may be administered the test at the end of one week in the program if the instructor feels that he will likely achieve the criterion reading level). The test is usually administered by the classroom instructors and is scored by the instructors or the program supervisor. When a recruit demonstrates a fifth grade reading level, he is assigned to a Basic Combat Training Company. After the sixth week test, all recruits report to basic combat training whether they achieve a fifth grade reading level or not.

Because of the differences in the training programs at the Navy

installations, the description of each are presented separately.

San Diego. The basic course of the Academic Remedial Training (ART) program consists of three weeks of reading instruction and two weeks of military instruction. With twenty-one instructional hours per week, the basic course consists of 105 hours. Recruits who do not demonstrate a fifth grade reading level at the end of three weeks instruction will receive remedial instruction for as long as three more weeks before entering the military classes. These recruits will receive instruction for a maximum of eight weeks or 168 hours.

Recruits receive approximately four and a half hours of instruction each day between the hours of 7:30 a.m. and 2:30 p.m. There are three blocks of instruction: 7:30 a.m. to 9:00 a.m.; 10:00 a.m. to 11:30 a.m.; and 1:00 p.m. to 2:30 p.m. In each instructional block the recruits have a fifteen minute break so that they are not in class longer than forty-five minutes at a time. The trainees are block scheduled according to the number of weeks they have been in the program.

Recruits are also required to attend a supervised study hall each evening. An instructor monitors the study hall and serves as a resource person in assisting students with their study.

Each instructor in the program is responsible for a class of six to eight students. The students are not grouped according to ability, so that in any class there are likely to be recruits at the nonreading level together with students who are reading very near the fifth grade level. A class of students will proceed through the first three weeks of instruction as a group. Those who pass the criterion test at the

end of the third week of instruction advance as a group to the fourth week class. Those who do not pass the criterion test will form a new class and receive remedial instruction for an additional three weeks. This remedial class will usually be small and recruits will receive instruction almost on an individual basis.

There are many instructional methods and techniques used in the program, and different methods are emphasized in different weeks of instruction. The first week class consists of phonics instruction. During this week, the instructor introduces, reviews, and reinforces new information. Recruits demonstrate their knowledge of phonetics and practice phonetic skills by completing numerous worksheets. The instructor corrects the worksheets and reviews the instruction with individual recruits or with the entire class.

In weeks two and three, the instructor also directs the group in presenting, reinforcing, and reviewing study skills information. In addition to reinforcing information through worksheets, the students work individually or in groups in developing reading speed through the use of several machines. Individual study carrels are used in this class.

In teaching Navy vocabulary in the fourth week, new information is presented to the group by the instructor and the student spends much of his time completing worksheets of Navy terms.

In the last week of the course the recruits complete reading assignments both in class and out of class from the Blue Jackets Manual, the basic training manual. There are several lectures and some training

films in this part of the curriculum.

Great Lakes. The basic course of the Recruit Remedial Literacy Training Unit (RRLTU) consists of three weeks of remedial reading instruction and one week of military instruction and preparation for taking the boot camp achievement tests. The course consists of approximately 100 hours of instruction. Classes are scheduled each day between 7:30 a.m. and 1:30 p.m. It has been determined that instruction will not be tailored to fit a class period of a specific length, but rather that the length of a class period will depend upon the amount of instruction. Class periods vary in length from seventy-five minutes to two hours.

The recruits are required to attend a supervised study hall for one and a half hours Monday through Friday, and for three hours on Saturday. One of the regular classroom instructors monitors the study hall sessions.

The average class size is fifteen students and there are two instructors assigned to a classroom. The recruits are not grouped according to ability. A class of students will proceed through each week of instruction as a group. At the end of a week those who pass the milestone test advance to the next week of instruction as a group. If a student does not pass the criterion test, he will repeat the week's instruction.

The principal method of instruction in the RRLTU program is teacher-directed instruction. In the first week of instruction, the instructors emphasize the proper behavioral requirements expected of

recruits. The recruits are given lectures and asked questions concerning the content of what they have just heard. The recruits are expected to learn how to answer distinctly, without guessing. They learn to take notes at the proper times and to listen without distraction. In addition to these behavioral requirements, the recruits are given instruction in phonic skills. They are expected to practice these skills as homework assignments. In the next day's class, this information is reinforced through instructor-directed review and discussion.

In the second week, the instructor directs the group in presenting, reinforcing, and reviewing study skills information. Oral and silent reading is demonstrated by the recruits, and the instructor reinforces the phonic rules learned in the previous week's instruction. The instructors also teach from a list of phonetically regular vocabulary words from Navy materials and tests.

In the third and final week of reading instruction, stress is placed by the instructor on applying rules learned in the first and second week. These rules are applied to new areas of phonetic skills and more difficult words. Recruits are expected to demonstrate understanding of these words. Again, drill, review, and question and answer form the pattern of instruction.

In the fourth week of instruction, the recruits review Navy boot camp materials through lectures and movies. They are advised on how to take and to pass their boot camp tests.

There are teacher-constructed tests for each week of instruction.

If a recruit fails to achieve the minimum passing score on the tests administered at the end of the first, second, or third week of instruction, he will repeat the week's instruction. The recruit who fails the fourth week test may be returned to boot camp or he may be referred to the Brigade Aptitude Board (BAB) for discharge. The final determination is made by the instructors.

Recruits participate in the program for a minimum of four weeks with a maximum of eight weeks of training possible. The program criterion test (Gates-MacGinitie Reading Test) is administered to all recruits when they complete the third week's instruction. An informal, oral, reading test is also administered at the end of this week, and a subjective reading level is determined for each recruit.

Orlando. The basic reading course of the Academic Remedial Training (ART) program consists of six weeks of instruction with six-and-a-half to seven hours of instruction each day. Total instructional hours for the basic course range from 195 to 210 hours. All recruits stay in the program for six weeks, at which time the program criterion test (Gates-MacGinitie) is administered. Those recruits who do not achieve the program objective on the test may receive up to two additional weeks of training.

The average class size is eight students. The students are grouped according to ability as demonstrated on the placement test. Classes are not of a standard length, but rather end when a segment of instruction is completed. The program utilized mechanical devices for most of the reading instruction. An audio-visual machine is used for phonics

instruction as well as reading speed and comprehension. The recruits often complete pages in workbooks as instruction is presented by filmstrip and tape recordings. Recruits usually work in a group progressing through instruction at the same rate, although they may at times work independently.

Instructors introduce new material and review completed material with the group, and they provide individual assistance when it is appropriate. Instruction is divided into units and recruits are expected to complete two units per day.

Educational Developmental Laboratories (EDL) practice and criterion tests are used as measures of progress within the program. The practice tests accompany each unit of instruction and allow both the recruit and the instructor to monitor and assess the recruit's progress. There are defined milestones and milestone tests within the EDL program.

The program criterion test (Gates-MacGinitie Reading Test) is administered by the classroom instructors and is given to all recruits at the end of their sixth week of instruction. Those recruits who demonstrate a 4.5 reading level on the test will join a boot camp training company. Those who are not successful on the test will take additional alternate forms of the test at the end of their seventh and eighth weeks in the program. At the end of eight weeks, all recruits are assigned to a boot camp training company whether they have demonstrated a 4.5 reading level or not.

READING PROFICIENCY CRITERIA

The reading level objectives of the literacy programs are specific

in terms of a grade level to be attained and the means of measuring the attainment. Standardized reading achievement tests are used by each service to assess achievement of the desired reading levels. In the Air Force the Reading Proficiency Unit's objective is that airmen will read at the sixth grade level as measured by the USAFI Achievement Test, published by California Test Bureau, 1950 edition, Level II, 1967 printing. A recruit is allowed to spend a maximum of thirteen weeks (sixty-five instructional days, 260 hours of instruction) in the program. The recruit may take his criterion test at any time that he and his instructor mutually agree that he will likely be successful on the test - as determined by the program milestone tests. Usually a recruit will not take the criterion test until he has spent at least one week in the program. The average number of days spent in the program was 42.5. Sixty percent of the airmen whose records were reviewed achieved the reading level objective of the program.

The objective of the Army Preparatory Training programs is that recruits will read at the fifth grade level as measured by the USAFI Intermediate Achievement Test (UIAT). Each recruit is allowed a maximum of six weeks or 180 instructional hours to achieve the program objective of a fifth grade reading level. All recruits are administered the criterion test at the end of their first, third, and sixth week of instruction. When recruits demonstrate a fifth grade reading level on the criterion test, they are graduated to Basic Combat Training. The average number of days spent in the program was 20.1 at Ft. Lewis, 16.5 at Ft. Wood, 18.0 at Ft. Campbell, 19.3 at Ft. Jackson, and 17.0

at Ft. Dix. Sixty-six percent of the trainees achieved the reading level objective of their programs.

The objective of the literacy training programs of the Navy is that recruits will read at the fifth grade level as measured by the Gates-MacGinitie Reading Test, Intermediate Level. (During the last half of Fiscal Year 1971, the reading level objective at Orlando NTC was changed to 4.5, when it was determined that recruits with the lower reading level were as successful in Boot Camp as recruits with a fifth grade reading level.) At Orlando NTC the criterion test is administered to all recruits at the end of their sixth week of instruction. Those who do not demonstrate the criterion reading level will take additional alternate forms of the test at the end of their seventh and eighth weeks in the program. At San Diego NTC and Great Lakes NTC, all recruits are administered the criterion test at the end of their third week of instruction. Those recruits who do not demonstrate the criterion reading level will retake the criterion test at the end of each additional week of instruction (maximum of eight weeks). The average number of days spent in the program was 28.7 at San Diego, 21.9 at Great Lakes, and 24.8 at Orlando. Among the Navy trainees, 76 percent reached the reading level goal established for their programs.

SUMMARY AND RECOMMENDATIONS FOR SECTION IV

The wide range of class hours allocated by each service to remedial reading is another indicator of the diversity to be found in the programs. The maximum possible number of hours range from 260 hours in the Air Force to approximately 100 hours available to recruits at

Great Lakes. However, since the programs are organized for students to progress at their individual rates the average number of hours spent in remedial reading training is less than the maximum possible. In practice the typical Air Force student spends almost twice as long in remedial reading training (42 days) as do his counterparts in the other services. Only at the Air Force's and the Navy's Orlando RRTU programs were students grouped according to reading achievement levels. Each program operates on a student-teacher ratio of approximately ten to one.

Standardized reading tests are used to assess achievement at the desired levels and to provide a basis for graduation from the program. For the sample of literacy program trainees whose records were reviewed, it was found that 60, 66, and 76 percent achieved the desired reading levels in the Air Force, Army and Navy respectively. The average number of days spent in the program was about 42, 18 and 24 for the Air Force, Army, and Navy. The variation in achievement and enrollment reflects differences in program objectives and evaluation procedures. It suggests that the incorporating of the best features of the three programs would result in substantial savings.